Motion and Sound

3-5 The student will demonstrate an understanding of how motion and sound are affected by a push and pull on an object and the vibration of an object (Physical Science)

3-5.4 Explain the relationship between the motion of an object and the pull of gravity.
Taxonomy level: 2.7-B Understand Conceptual Knowledge

Previous/Future knowledge: In first grade (1-5.2), students explained the importance of pushing and pulling to the motion of an object. In 4th grade, students will relate the Moon's pull of gravity on Earth to the high and low tides of the oceans (4-3.6), and they will relate Earth's pull of gravity on the Moon to keeping the Moon in orbit around Earth (4-3.6) as well as the Sun's pull of gravity on Earth to keeping Earth revolving around the Sun (4-3.3). Students will further develop the concept of the effects of the force of gravity on motion in 5th grade (5-5.1).

It is essential for students to know that the pull of gravity attracts objects to one another.
- The pull of gravity is everywhere.
- Earth's gravity pulls objects toward the center of Earth.
- The pull of gravity holds things down on Earth.
- Things fall to Earth because they are pulled straight down by Earth's gravity.
- No matter whether an object is dropped or thrown, it will always fall toward Earth's surface.

It is not essential for students to know how fast objects fall (acceleration due to gravity) or how masses and distances of objects affect the strength of the pull of gravity. They do not need to explain any quantitative relationships between the pull of gravity and the motion of objects.

Assessment Guidelines:
The objective of this indicator is to *explain* the relationship between the motion of objects and the pull of gravity; therefore, the primary focus of assessment should be to construct a cause-and-effect model of the way the pull of gravity can affect the motion of objects. However, appropriate assessments should also require students to *infer* which direction an object will move if dropped or thrown on Earth; or *interpret* a diagram of objects being dropped or thrown and how the pull of gravity will affect them.